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NATURAL RESOURCES OF UKRAINE

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TERRITORY AND HISTORY

Ukraine embraces the former southern parts of European Russia and includes the following provinces: Podolia, Volynia,[1] Poltava, Kiev, Chernigov, Kherson, Kharkov, Ekaterinoslav, and Tauria. In 1918 Ukraine separated from Russia and passed thru several stages of political organization during the succeeding five years. In 1923 it was again annexed to Russia and is at present a part of the Union of Socialist Soviet Republics.

Ukraine occupies, within the boundaries of the above named provinces, a territory of 184,698 square miles. The area of each of the provinces is as follows:

Provinces	*Sq. Miles*	*Provinces*	*Sq. Miles*
Podolia	16,246	Kherson	27,374
Volynia	12,903	Chernigov	20,258
Poltava	19,291	Ekaterinoslov	24,511
Kiev	19,702	Tauria	23,344
Kharkov	21,069		
		Total	184,698

The Russian Empire was engendered and later formulated in Ukraine. At the beginning of our era the spacious steppes of Ukraine, stretching along the shores of the Black Sea, served as habitat to the various nomads. But in the course of time these nomads were forced out and in their place came various Slavonic tribes, the progenitors of the population of Ukraine of today. The Russian Empire was founded in the ninth century and in the tenth century Prince Oleg made Kiev the capital of the Russian Empire. But the ceaseless devastating invasions of the war-like tribes of the nearby steppes gradually disintegrated the stability of the Slavonic tribes, grouped about Kiev. All these invasions, and especially the one of the Tatars prevented the formulation of a strong and

[1] Part of the former Russian province is now in Poland.

independent empire, weakening and disorganizing the Ukrainian tribes, as a result of which the Russian capital was transferred. Ukraine lost its independence, and in the course of time fell under the influence of the neighboring tribes. The southern provinces went over to the Tatars, the western to Poland and the northwestern to Lithuania. In 1594 Lithuania united with Poland. Thus Ukraine became part of the Polish territory. But altho enjoying the protection of a mighty power, Ukraine nevertheless did not cease to suffer from frequent invasions, continuing down to the end of the sixteenth century. These invasions were so devastating that almost the entire vast territory, scattered on both sides of the Dnieper River, soon became a desert. Then the invasions decreased somewhat, for the most part owing to the protection of the then powerful Poland. The fertile land and the favorable climate exerted their influence and the region gradually came to life. In 1654 part of Ukraine was separated from Poland and annexed to Russia after the revolt instigated by Bogdan Khmelnitsky, but in 1667 Russia signed a peace treaty with Poland in accordance with which Ukraine was partitioned. One of the sections, nearest to Poland was ceded to that country and the second section, situated on the east side of the river Dnieper was taken by Russia.

The revolt started by the people of Ukraine in the hope of securing more political freedom, did not bring about the expected results. Oppression practiced consistently by the Moscow government gave birth to much discontent among the masses of the people. This afterwards resulted in open revolt, under the leadership of the famous Ukrainian patriot Doroshenko. With the support of the Crimean Tatars and of Turkey, Doroshenko hoped to create a free and independent Ukraine. But, in spite of such outside assistance, this attempt failed, as did the attempt to deliver Ukraine from Russia, made by the famous Ukrainian leader Mazeppa during the reign of Peter the Great. Profiting by the widely spread discontent in Ukraine, Mazeppa hoped to effect a separation of his country from Russia, and with this in view sought the help of Poland and Sweden. During Russia's war with Sweden, Mazeppa openly went over on the side of Karl XII, thus hoping to bring about the independence of Ukraine. But the famous victory of Peter the Great, under Poltava in June 1709, decided among other things the fate of Ukraine. As for

Karl XII and Mazeppa, they saved themselves by fleeing into Turkey. Peter the Great offered Turkey a tremendous sum for delivering Mazeppa. He was not given up, but as a result of the defeat, his already poor health began to fail and he died on August 12, 1709. Russia then redoubled its efforts to stamp out all the national aspirations of Ukraine, and after the partition of Poland, nothing was left of its former independence. Even the very name "Ukraine" went out of usage and in its place the Russian government introduced the name of Little Russia. Only the great world war again brought to life the possibility of Ukraine's independence. Altho, at present, Ukraine is an independent republic constituting a part of the Union of Socialist Soviet Republic, yet in truth the extent of its independence is so insignificant that it can hardly be considered an independent country.

Human Resources

The population of Ukraine for 1914[2] was estimated to be 31,354,700 distributed thruout the various provinces as follows:

Province	*Population*	*Density per sq. verst*[3]
Kiev	4,792,500	107.0
Podolia	4,057,300	109.9
Volynia[4]	2,905,100	66.5
Chernigov	3,131,500	68.0
Kharkov	3,416,800	71.3
Poltava	3,792,100	86.5
Kherson	3,744,600	60.2
Ekaterinoslav	3,455,500	62.0
Tauria	2,059,300	38.8
Total	31,354,700	74.4

Therefore, the most densely populated provinces are Podolia, Kiev and Poltava, and the least populated is Tauria. But even this province surpasses European Russia, where the average density was estimated to be 30 persons to the square mile.

The Ukrainians are the predominating element in Ukraine. In the eastern and northern parts of the country the admixture of the Russian element increases; in the northwestern, the White Russians; and in the southwestern and western the Polish. The

[2] Statistical data for later years are not dependable.

[3] 1 square verst = .662 sq. mi.

[4] Without the parts ceded to Poland.

nobility in Ukraine consisted almost wholly of Poles. In towns and villages the predominating elements were Poles and Jews. In some places one may find German colonies, as for instance in Volynia, Kherson and Podolia provinces. In Volynia Province a certain amount of Czecks may also be found, and in Kherson, Tauria and Ekaterinoslav provinces, Bulgars, Serbs, Greeks, Turks and Tatars. The national grouping of the Ukrainians, according to the data of 1914, in percental relations was represented as follows:

Provinces	*Ukrainians*	*Russians*	*Poles*	*Jews*	*Germans*	*Turks and Tatars*	*Others*
Kiev	79	6	2	12			1
Podolia	81	3	3	12			1
Volynia	70	3	7	13	6		1
Chernigov	86	4		5			5
Kharkov	70	28	0.5	0.5	0.5		0.5
Poltava	95	1		4			
Kherson	54	21	1	12	5		7
Tauria	42	28	1	5	5	13	6
Ekaterinoslav ..	69	17	1	5	4	1	3
Total	71.7	12.3	1.8	7.6	2.3	1.6	2.7

As for the professional composition of the population of Ukraine, it may be said that the chief occupation of the population is agriculture, engaged in by 75 per cent of the total population. Next comes the manufacturing industry, then, mining industry and handicraft, pursued by about 9 per cent of the population. Trade is engaged in by 5 per cent of the population; domestic work by 5 per cent; transport by 1.5 per cent; and other professions by 4.5 per cent. Most of the population of Ukraine is centered in villages, as the rural population constitutes 86.4 per cent and the city only 13.6 per cent of the total population. With regard to religion, the Greek orthodox faith predominates, 83 per cent of the population belonging to this church. Then follows Jews, 7.6 per cent; Catholics, 2.8 per cent; Protestants, 2.4 per cent; Mohammedans, 1.2 per cent. Culturally, the population of Ukraine is very low, as the percentage of literates is but 13.6 per cent of the total population.

Agricultural Resources

Agriculture in Ukraine had played from times immemorial a very significant rôle in the economic life of the population. Until the Bolshevik Revolution, land-ownership in Ukraine was charac-

terized by large estates, chiefly in the hands of Poles. Kiev province, for instance, according to statistical data of Prof. A. Yaroshevich, had 43 large estates, with an average area of 13,500 acres, constituting on the whole about 38 per cent of the entire private land ownership of this province. The size of these estates can be judged from the fact that Kiev province had 62 estates with an average area of 1,900 acres; Podolia 70 estates with 1,600 acres; and Volynia 32 estates with 1,500 acres.

Poles were not only the largest land owners in Ukraine, but also held high positions in various branches of agriculture and the sugar industry. They also rented many estates and had on the whole a considerable social-economic and cultural weight in Ukraine.

While Poles and Ukrainians constituted the agricultural group, Jews, inhabiting towns and villages, controlled most of the commerce and trade of the country.

The climatic conditions of Ukraine are excellently adapted for agriculture. Most of the soils in Ukraine are chernozem, known for their fertility. West of the Dnieper River the chernozem forms a more massive layer than in the east, and only in the northern parts of Volynia province does it yield to sandy and swampy soils. Farther south, chernozem becomes more thin and along the shores of the Black Sea sand and clay predominate, the southern region of the country presenting a typical steppe. Taking into consideration the above named favorable conditions it is not surprising that agriculture flourishes in Ukraine.

Conditions of land utilization in Ukraine is shown approximately by the following data:

	Acres	Per cent
Plowed land	86,359,500	70.6
Pastures and meadows	15,114,600	12.3
Forests	12,500,000	10.2
Non-arable lands	8,307,900	6.7
Total	122,282,000	99.8

The above data show that Ukraine has made excellent use of its land which predetermines its agricultural power.

Wheat is the predominating product, followed by barley, rye and oats. A more detailed picture of agricultural conditions is given in the following data for 1914:

	Per cent
Wheat	30.0
Barley	22.8
Rye	19.0
Oats	10.5
Buckwheat	3.9
Potatoes	3.0
Millet	2.0
Other products	8.2
Total	99.4

The average production of the chief agricultural products in Ukraine for the years 1909-1913 is given in the following table:

Products	*Crop (in poods*[5]*)*	*Per cent of total production in Europe*	*Per cent of world production*
Wheat	412,661,500	27.5	6.7
Rye	239,523,300	17.2	8.5
Barley	271,945,200	40.0	13.3
Oats	147,201,200	13.0	3.7
Potatoes (1913)	332,800,000	15.2	4.0
Sugar beets (1914)	672,600,000	86.0	

In addition to preceding chief products, many others are cultivated in Ukraine, viz., corn, tobacco, hemp, flax, buckwheat, millet, sunflower, and various kinds of vegetables. Ukraine is also rich in orchards where a great variety of the most delicious fruits are cultivated. All of these data speak most convincingly of Ukraine's agricultural significance to Russia, and in this respect it could be rightly called Russia's granary. This is why Russia always aimed to hold this country, and even at the present time the same policy is pursued.

The agricultural products of Ukraine more than amply covered all the local needs and left a considerable surplus for export. Ukraine's average annual production of various cereals per person was 1,260 English pounds, while its consumption per person was 860 pounds, thus leaving a surplus of 396 pounds. The chief foreign trade products of Ukraine were those of agriculture, constituting about 80 per cent of its total trade. This can be seen in a more detailed way from the following statistical data for 1913.

Articles of Export	*Value in Dollars*
Agricultural products	$186,000,000
Sugar	80,000,000
Metal products and metals	33,600,000

[5] 1 pood = 36.113 pounds.

Poultry	15,000,000
Products of cattle breeding	11,950,000
Iron manganese ores	4,250,000
Coal	600,000
Other products	5,100,000
Total	$336,500,000

Animal Husbandry

Animal husbandry also plays an important rôle in the economic life of Ukraine parallel with its crop husbandry. In the nine provinces of Ukraine, according to data for 1916, the number of domestic animals was as follows:

	Number of Animals	*Per 100 People*
Horned cattle	8,016,800	20.3
Sheep	7,350,400	19.3
Horses	5,754,600	17.5
Pigs	4,894,000	13.2
Goats	60,800	0.2
Camels, elephants, and others	4,300	
Total	26,080,900	

Kherson and Ekaterinoslav provinces have the largest number of horses and Volynia and Kherson are the richest provinces in horned cattle. The breeding of sheep is especially well developed in Tauria and Chernigov provinces.

Forest Resources

With respect to forest resources Ukraine may be divided into two parts; the Southern or Steppe region and the Northern or Forested area. Several provinces, therefore, have comparatively little forest areas. The extent of forested area in separate provinces is approximately as follows:

Provinces	*Area (in acres)*	*Per cent of Total Area*	*Acres per Person*
Volynia	4,510,344	25.4	1.51
Kiev	1,906,980	15.1	0.51
Chernigov	1,724,438	14.4	0.81
Podolia	985,362	9.5	0.30
Kharkov	1,096,772	8.1	0.43
Tauria	788,178	5.3	0.40
Poltava	611,676	5.0	0.22
Ekaterinoslav	584,439	3.7	0.27
Kherson	290,857	1.7	0.11
Total	12,499,046	9.8	0.50

MINERAL RESOURCES

Ukraine does not pride itself on possessing such precious metals as platinum, gold and silver, but, it has considerable quantities of coal, iron, and manganese, and an excellent quality of clay. Especially rich in minerals is the so-called Donetz plateau, situated in the southeastern part of the country.

The principal coal fields are located in Kharkov and Ekaterinoslav provinces, whose deposits are estimated to contain approximately 65,574,000,000 metric tons.[6] In addition large deposits of brown coal are found in Kiev, Kharkov and Volynia provinces. The mining of coal in the Donetz basin during recent years is shown by the following data.

Years	*Production from the portion of the Donetz basin situated in Ukraine (in poods)*	*Production from entire Donetz basin (in poods)*
1913	947,000,000	1,544,000,000
1914	1,125,000,000	1,684,000,000
1915	1,044,000,000	1,627,000,000
1916	1,076,000,000	1,751,000,000
1917	908,000,000	1,930,000,000

Iron ores are found in many places in Ukraine, viz., in Volynia in Ekaterinoslav, Kherson and Tauria provinces. In 1915 thruout the foundaries of Ukraine produced about 65 per cent of the total iron and pig-iron production of Russia.

Ukraine is particularly rich in maganese, mined for the most part in Ekaterinoslav province not far from the city Nikopol. Its average annual production constituted approximately 14-17 million poods, about 32 per cent of the total production of maganese in Russia.

In addition Ukraine has a considerable quantity of salt, oil, graphite, mercury, mica and other minerals. Ukraine is especially noted for various kinds of clays, as a result of which pottery is well developed here, as well as the production of various building materials.

[6] 1 metric ton = 2,204 pounds

THE GEOGRAPHY OF SWITZERLAND TAUGHT THRU CREATIVE EDUCATION

A PROJECT IN THE SIXTH GRADE

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The Project

To make a representation of the Swiss Alps to show how the Swiss with very few natural resources adjust themselves to environment and convert obstacles into advantages.

"Joe, you fix the tunnel so that trains can go under the mountains on their way to Italy."

While Joe, the engineer, tunneled under the Alps, Frank and John made the glacier between the peaks. Meanwhile, Frances and her assistants placed the cattle and the goats on the mountainside.

This scene, not at all imaginary, took place in a sixth grade where the project method is used.

On a table two mountains of clay were made and on these mountains were placed all the representative things of the country of the Alps. The whole model was about three feet long and two feet wide.

By the use of salt, flour, and water, a glacier was made between the two peaks, and descending from the glacier was a swift-running stream. Along the stream, where the icy waters flowed very swiftly, there was a little mill, turning out "white coal" to make up for Switzerland's lack of real coal.

At the base of the mountain, surrounded by forests, terraced vineyards, and fields of barley and rye, was a monastery from which the great St. Bernard dogs sallied forth after winter snow storms. High above the tiny chalets were the goats and cattle whose milk the farmer folk convert into cheese and the famous Swiss chocolate. At the summit of the peak there was a tiny cavalcade of tourists roped to their guide, who had just reached the summit where he planted the red flag that told the universe of their achievement.

Around the room there are pictures of the tourists, mountains and glaciers, while at another table there are silk and embroidered products as well as examples of Swiss wood carving.

Aims

In carrying out this unit of activity the most important returns would be perhaps intangible, immeasurable results such as attitudes, outlooks, ideals, character effects, cooperation, participation, socialization, and leadership in communal life. When we consider such important intangible results as the chief aims of education, we give a closer and more subtle study to the procedure which will give opportunity for the developing and crystalizing of such desirable characteristics. In the past in the organizing of subject

matter, the aims have been in more measurable returns, based on what children should know and what they need in adult life. In this work more thought has been given to the kind of citizenship we want, also the ideals and attitudes we want in our children.

The purpose in this is *not* to give *concepts* of Swiss life. Concepts no doubt are gained from pictures, reading, and imagination before the object can be represented. Giving opportunity for the expression of a child's natural capacity for creation and manipulation would be a purpose in objective work. To give a part in the communal life of this school room to the boys and girls whose mental capacity limits them in delving far into problem solving, studying and planning should also be an aim. For example, a little boy whose I. Q. was under 70, with joy in his heart, made better than any one in his group, the little chalets that were to be on the hillsides. Except where classes have been organized and classified according to the results of mental testing, there are children of varied mentality. Why not have a procedure which provides for all?*

Other immediate aims measuring the social value of their work, and other similar work, would be:

1. To show in what way man reacts to the earth's stimuli; how he is dependent on nature; how he may adapt himself to geographic conditions, and how his various pursuits are earth determined.

2. To teach the geographic principles which underlie Swiss life and customs. To show in what way the Swiss people have responded to geographical influences and are turning to advantage the resources and obstacles to which they are heir. Geographically to represent the homes, resources, and industries of the Swiss.

3. To obtain a fundamental working knowledge of Switzerland and its inhabitants, their relation and their contributions to the rest of the world.

Thru this project practically all of the school arts are utilized; a great deal of reading, much oral and some written language, some penmanship, arithmetic, art, and much handicraft. Geography, language, spelling, arithmetic, reading, and history were all included, and necessary for the marking out of the activity.

The interrogation in the mind of the teacher would be, "Are these boys and girls learning how to investigate, how to find and use sources? Are they developing good habits of thought and study? Are they making accomplishment the fashion?"

*This statement is made at length to refute a criticism which was made by one or two educators who were either ignorant or possessed incomplete knowledge of child nature and of objectives in education.

It is interesting to discover that while not teaching for measurable results, that children working with a purpose, test very high in the measurable facts of skill and knowledge.

Organization

One of the great problems of project teaching is organization. Many seem to think that the children go ahead and work with no plan and no organization. This work requires the most careful planning on the part of the teacher. There is a *best* way to do things to save time and to give opportunity for real thinking, purposing, and planning on the part of children. Any teacher who is not cognizant of this fact is likely to be a failure in this work.

In answer to the many, many questions from students and teachers of, "How did you start it? How in the world did you get it going?" this part has been written. It is the purpose to show the organization of this work. Stenographic reports were taken of the work showing what actually took place in the room.

Getting the Project Started

The situation out of which this activity grew, while raised naturally, was not really an outgrowth of a natural situation. As long as there are rigid courses of study, it is well to adjust the activities to them, which is what was done in this case. Switzerland came next in the course of study. The teacher had in mind to make some kind of a representation out of paper because she herself dreaded the confusion of the children working with clay. The following report shows how the reasoning of the class showed clay to be more reasonable, so she let their purpose carry.

The story of "Heidi" was used to lead from one activity to another in a natural way and in a natural situation. In the following report can be seen how the teacher guided them away from their first idea to dramatize to the constructing of the mountain. This is perfectly legitimate on the part of the teacher. It is her business as a teacher to know the next step needed in their development. It is her business to question the social value of activities and to lead them to worthwhile ones.

Raising the Project

In preparing for the silent reading feature of a literary contest, the children read Spyri's "Heidi" at home, many of them completing it in two nights.

After the book had been finished the teacher asked, "Who can give us a picture of the life of the Swiss people and the little country where Heidi lived?" The description being satisfactory, she continued, "What more might we do to make clearer to ourselves the Swiss life and customs, as well as to let visitors know what we are doing?"

Lavade. I should like to dramatize the story of "Heidi." We might dramatize some of the best parts.

Sylvia. Different ones of us might be Heidi, Klara, Peter, the alm-uncle and the rest.

FIG. 1—A representation of the Swiss Alps

Sarah. We might dramatize the scene where Heidi goes up to the alm-uncle's house and where she goes to live with Klara.

Teacher. Those are good suggestions and we might carry out some of them, but what could we do to have something to show the visitors as well as to make very clear to ourselves the kind of country where Heidi lived and the different things that she and her friends did?

Roy. We might make a hut out of matches like the one where the alm-unkle lived.

Dorothy. And we might make some goats out of cardboard and show them feeding on the Alps.

Elmer. We ought to show the mountains. We could make a background out of cardboard to represent them.

Teacher. But how could we show the goats on the mountain side?

Elmer. We could fasten them against the side of the mountain.

Teacher. What about the little house?

Elmer. We could make the mountain so the house would stand on it by bending the cardboard.

James. I think it would be better to make the mountains out of clay. Several other boys and I could get some Saturday, and we could make our mountains like the sphinxes we made for the sandmap of Africa.

Warner. I don't think clay would be very good because it gets all over the floor and it's so hard to clean up.

James. If we used clay, we could clean it all up when we finished, and besides, clay is more substantial than cardboard and it looks more like real mountains.

Teacher Leading

As there was such a decided difference in opinions, vote was taken and the majority were in favor of using clay.

Edgar went to the board and made a list of the materials needed and of those who volunteered responsibility for them.

From the first the teacher had in mind to construct with clay a Swiss mountain scene showing in what way the Swiss have made the most of their resources and converted their obstacles into advantages. Having succeeded thus far in getting the *children* to *decide* on a scene made of clay, she proceeded to bring out the ideas of showing the industries.

Teacher. I was surprised that you wanted to represent the story of "Heidi," because it's only a fourth-grade story. Sixth-grade children should be able to bring out and show the important things about Switzerland.

Beatrice. We could make a waterfall to show how the Swiss get power from white coal.

Cleo. We could show the forests and the cattle feeding on the Alps.

Robert. When we finish it we could make some tourists climbing up a mountain to show how the Swiss make money from the beautiful scenery.

Robert. When we finish it we could invite some other room in to see it.

Organization on Part of Children

After the project has been raised and the children are keen to get started comes the problem of organizing so as to get the best planning and executing from the children.

They are now ready to make the Alps and to show how the Swiss make a living. The next thing to do would be to get them to find out what they are to make. It is a good idea to find out first what they already know. In this lesson after some discussion each one listed on paper all the things he knew of in Switzerland which could be represented. One boy put his list on the board. Others added to it. It was then suggested that they could find more things in their books. Allen's "New Europe" was found to be a gold mine of valuable information. A most valuable silent reading

lesson was carried on. Many objects were added to the list, which when completed was as follows:

goats	cattle	glacier	stream
waterfall	Alps	chalet	hotels
tourists	mill	lakes	patch-work fields
railroads	St. Bernard dogs	trains	bear

The next problem would be "Materials" needed to make the objects. Another list was completed as follows:

clay	glass	flour	yarn
pins	cardboard	cotton	wire
wood	matches	salt	tinfoil

Different children volunteered responsibility for various materials. A group of boys who rode bicycles were to bring the clay from the river, others to bring matches, cotton, etc. The materials were to be kept on a table until needed. Groups were formed and planned to make certain things, so that each object was provided for and each child had a part in the planning and executing.

By experience in the past they had *met* and solved the problem of the necessity for a standard of measurement. Very early they discussed and decided to use a chalet as the standard, making everything else in proportion to that.

They had also learned before the necessity for careful planning. As soon as they knew what they were to make they began hunting pictures, and information sources which would help them. They consulted the teacher's books, pictures, and one another as to the best way to represent the object they were to make.

The following morning groups and individuals reported and a wealth of material was brought in about resources, industries, exports, imports, cities, etc. The materials for construction were assembled and work began. Pictures and books as guides were at hand; all children working in groups for the successful culmination of the undertaking. Some did much more reading than others; some took more part in planning and organizing. A careful record was kept of each child's work, to see that the capacities of each were utilized.

After attention had been centered in Switzerland the children were very much interested in finding it on the map. The following were some of the problems brought up and solved:

1. Computing length and width by scale. Could you cross Switzerland in a day?
2. Guessing comparative sizes of Switzerland, France, and California from map, and verifying with table of areas.

3. Using density of population map. Comparing with California in number of inhabitants.

4. What can you tell about the surface from the map? Mountains, rivers, slope, etc.?

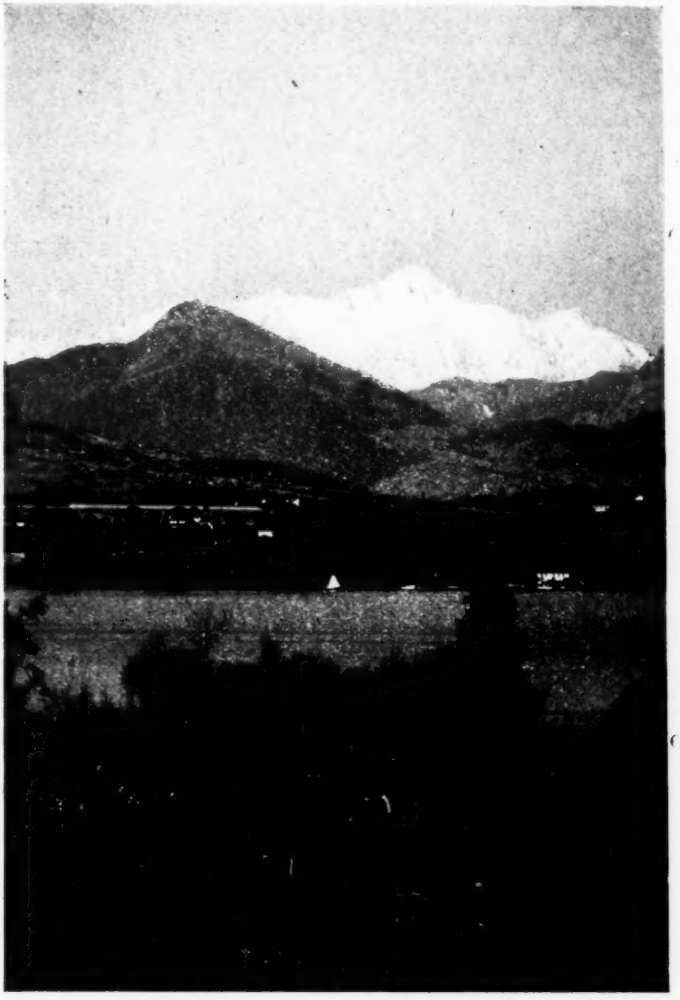

FIG. 2—Mont Blanc seen from Ariana (Geneva). The lake, the mollassic hills, and the flysch Prealps (Voirons) covered with cultivation, forests, and pastures are dominated by the rocks and snows of the great mountain. Courtesy of *The Geographical Review*, published by the American Geographical Society, N. Y.

5. Study climate with latitude, altitude, and position, and compare with countries already studied, especially the United States. Study climate from pictures.

6. Study industries from pictures of forests, tourists, etc.

7. What can you learn from the pictures of the houses?

In this study it was discovered that Switzerland had very few natural resources. The children had given a play earlier in the year, "Uncle Sam's Resources." They reviewed the resources.

PROBLEMS ON CONSERVATION

1. What are natural resources?
2. Which are exhaustible and which inexhaustible?
3. The importance of conservation
4. The patriotic viewpoint
5. Use and abuse of resources

Materials were brought and a wealth of information about resources, industries, exports, imports, cities, government, language, history, places of interest, sports, etc., was learned.

One of the first problems was, "What natural resources could be represented in the Alps?" After a problem was raised the children studied to solve it. They decided that "White Coal," "Lumber," and "Grass" could be. The following additional problems were brought up and solved in working out the project.

ADDITIONAL PROBLEMS SOLVED

1. What are natural resources?
   - Minerals
   - Water power
   - Timber
   - Fertile soil
2. What natural resources should we allow on our sand table?
   - White coal
   - Lumber
   - Grass
3. How could so many people live and prosper in so small a country with so few natural resources?
   - Manufacturing small articles with water power
   - Tourist trade
   - Tax
   - Railroads
   - Farming
   - Dairying
   - Embroidering
   - Fertilizer from air
4. How could Switzerland with no coal become an important manufacturing country?
   - White coal
   - Central position
   - Intelligence and skill
   - Manufacturing small articles
5. Is all the manufacturing carried on in the cities?
   - Embroidering
   - Woodcarving
   - Cheese-making

6. Why do we see cattle and goats on the mountain?
   Dairying
   Chocolate
7. What kind of people would you expect to find in Switzerland?
   National characteristics
   Great men of Switzerland as Rousseau, Pestalozzi, Agassiz, William Tell
   History
   Government
   Religion

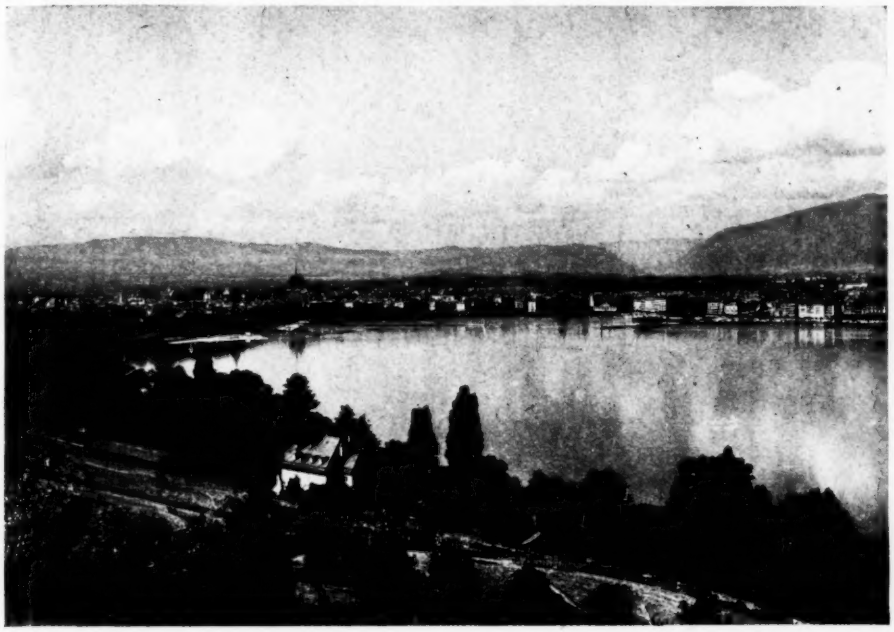

FIG. 3—Geneva seen from the lake: the roadstead; to the left, the cathedral of St. Pierre; in the middle ground, territory of the canton of Geneva; in the background, the mountain girdle (to the right the Crédo fronting the Montagne de Vuache) pierced by the gorge of the Rhone. Courtesy of *The Geographical Review*, published by the American Geographical Society, N. Y.

8. Of what great value are the trees which we have represented on our mountains?
   Wood for carving
   Prevention of landslides
   Fuel (used by peasants)
9. Could you cross Switzerland in a day?
   Railroads
   Tunnels
   Roads

THE CULMINATION

After the mountain had been completed and the great amount of material about Switzerland had been organized, everything was

ready for the grand finale. Pictures were arranged on the chalk-rail, and Swiss souvenirs were brought to school. One outline was made to include all the work on Switzerland. Each group-leader selected a problem and arranged the subproblems for his group.

After an explanation of the mountain for the benefit of the visitors, the children discussed some of the important geographical problems which concerned Switzerland. An effort was made to discuss only those things which are worth-while. As far as possible, the talks were illustrated by pictures and souvenirs.

It was planned that on the last day they should sum up all the work on Switzerland.

Close account was kept of each pupil's work and it was reviewed by a "ball-game" and checked up by a one word test.

TESTING RESULTS

1. What is the capital of Switzerland?
2. What city is noted for silk?
3. Draw something for which Geneva is noted.
4. Give three natural resources of Switzerland.
5. Name three important industries.
6. Name two rivers that rise in Switzerland.
7. Name two tunnels under the Alps.
8. Where and by whom was a lion carved?
9. Name a great hero of Switzerland.
10. What is the Swiss form of government?
11. Name three agricultural products of Switzerland.
12. Name two lakes in Switzerland.
13. What is the highest peak in Switzerland?
14. Name a great obstacle the Swiss must overcome.
15. What three languages are spoken in Switzerland?
16. What is the highest mountain in the Alps?
17. Name three industries carried on in the homes.
18. Name the great center for embroidery.
19. What country is south of Switzerland?
20. What is the largest city, and for what is it noted?

RESULTS

The completed mountain was an artistic as well as an accurate representation of Swiss life and industries. To the right were two mountains rising abruptly on two sides, but sloping more gently to the left were placed tiny chalets, a monastery, terraced vineyards, fields of rye, oats, and barley, orchards, and stacks of natural hay. On the tiny flower studded Alps high in the mountains, were goats and a little lower were cattle grazing on the tender grass.

The blinding snow and ice and a glacier displaying a yawning crevasse were constructed of salt, flour, and water; and away in the dizzy heights was a little caravan of yarn men who had just attained the summit and were planting the red flag of victory. At

FIG. 4—Lateen-sailed boat loaded with stone from Meillerie entering the port of Geneva. Courtesy of *The Geographical Review*, published by the American Geographical Society, N. Y.

the foot of the mountain was the hotel from which the tourists had started early in the morning.

Proceeding from the melting glacier and fed by the melting snows, flowed a turbulent mountain stream on the side of which

was a mill that generated electricity for lighting and the manufactures of the city below.

One side of the mountain was wooded with both evergreen and deciduous trees.

Under the mountain was a tunnel thru which a tiny train was starting for Italy.

Each object on the mountain was chosen because of its importance, and the children proved to be capable of fully grasping the great geographical principles which they represented.

The completed project was considered so good that many visitors came to see it and several other rooms were invited in to derive some benefit from it.

Altho only six days, including the last day for the summary of the country, were used for the study of Switzerland, a considerable amount of material was collected and organized, and the sand-table showed much study and handwork.

Thruout was shown a splendid spirit of helpfulness, children praising, criticizing, lending material, hearing one another's recitations, and drilling one another.

The work was ample and varied enough that each child could find something to do in which he was interested, and every one had a share in the success of a wholehearted, purposeful, vigorous activity which took place in a social situation and in accordance with the laws of learning.

Above the sixth grade or even the fifth, problems or intellectual projects perhaps would be more worth while than activities involving construction. However in the intermediate grades a project of this type is very worth while not only in measurable results but in concomitant values.

GEOGRAPHY AS A CORRELATING SUBJECT IN THE HIGH SCHOOL

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Geography as a school subject is particularly well adapted as a correlating center for other subjects in the curriculum. Starting as it does with the powerful influences of our physical environment, such as relief, soil, and climate, geography soon develops intimate and inseparable relationships with many other subjects. This interrelation is to be found not only in the "tool" subjects, such as arithmetic, English and the languages, but to a larger extent perhaps in such "content" subjects as history, economics, literature and science.

Correlation of subject matter in the grades is perhaps easier than in the more highly specialized curriculum of the average high school. Hence the line of least resistance is to neglect the correlation of various courses of study in the more complex organization of the secondary school. Yet, with the more mature minds of high school students, it would seem that there is even greater need of correlation as a practical means of teaching the complex correlations that exist in all life situations. On account of the segregation of subject matter and unconscious egotism of specialists, it requires a considerable amount of tact, helpfulness, enthusiasm and energy to bring about the necessary cooperation between departments. Geography makes a natural and effective correlating agent and this very fact can be used to good advantage in upholding the prestige of geography as an important and necessary subject of the curriculum.

AN OPPORTUNITY FOR CORRELATION

During the last school year, the writer had a unique opportunity to develop geography on an independent basis in the high school curriculum. Previous to that year, a perfunctory course in commercial geography had been given as an adjunct of the commercial department. In order to broaden the subject and create a greater interest, geography was grouped as one of the courses in the Department of Social Sciences. It was made a general and regional course rather than a purely commercial course. Two up-to-date texts, outline map books, and laboratory

CORRELATIONS WORKED OUT DURING FIRST HALF YEAR, 1923-1924

Courses Correlating	Subjects Taken Up	Methods Followed
Geography Ancient History	Historical development of American rivers and trans-Mississippi region Geography of the Mediterranean region	Classes exchanged for three periods Lecture method by both teachers and note-taking by pupils Extensive use of wall maps
Geography Commercial Arithmetic	Use of statistics and tables for problems in commercial geography Standard time zones; elements of latitude and longitude	Classes exchanged for one period Explanation by teacher in each group Directed use by pupils of statistical source material in one group and of transcontinental time-table in the other
Geography General Science	Important divisions of animal and plant life (preceding study of distribution) Rock weathering and soils	Classes exchanged for two periods Explanation by teacher with detailed outline and notes Extensive use of specimens and other illustrative material
Geography Economics	"Economic Importance of Conservation" "Natural Resources of the U. S."	Classes exchanged for two periods Lectures and note-taking
Geography Solid Geometry Biology Chemistry	"Crystal Forms in Nature"	Joint meeting for one period Lecture illustrated by specimens, drawings and lantern slides
Geography Biology	Forestry in the United States Forestry in relation to geography Forestry in relation to agriculture	Joint meetings for six periods Series of illustrated lectures Pupils of all classes recite on slides from carefully prepared outlines. Thoro practice in note-taking by all pupils on special mimeographed forms
Assembly of Entire School	"Forest Conservation" "Our National Parks"	Illustrated lectures Notes by geography and biology students

notebooks were put into use by all pupils. The recitation room was made distinctly a "Geography Room" with the best of wall maps, specimens of commercial products, atlases, gazatteers, supplementary texts, weather maps, bulletins and such other important "teaching tools" as a globe and stereopticon lantern at hand for instant and constant use. The enrollment in the course was over one hundred in five divisions meeting daily. Active field trips were also made an essential part of the course. The work thus started is now being carried on by another teacher on the same basis. A differentiated course is being developed in the curriculum and the course of study is now in available form.

With such a background it was possible to make this course a vital and interesting part of the school curriculum. Not only was the work of the course itself thoroly improved and motivated, but a number of interesting correlations with other courses were successfully tried out. The accompanying table shows briefly the joint meetings and exchanges that were carried out during the first half year. These correlations were not planned at the beginning of the year but were the practical results of suggestions that were brought up from time to time. Owing to the experimental nature of these trials, more careful and effective planning for future cooperation could be made as time went on. It was the unanimous opinion of the teachers concerned that such work was of real value to their pupils. Aside from the actual material which they secured there was the stimulating effect that could be brought about by listening occasionally to material presented by the teacher of another subject. There was likewise a stimulating effect on teachers when they had a definite opportunity to feel that they could be of value to other classes.

Classes Exchanged and Joint Meetings Held

Two general types of meetings are evident from the table, namely, where classes are exchanged by teachers for one or more successive periods and where classes hold joint meetings. When two classes are studying two different subjects and the two teachers find that they can be of mutual benefit to each other, they may exchange classes. Since it is often necessary to break the continuity of the courses to some extent, the work should be carefully planned. The pupils should be made to understand and fully appreciate the purpose of the exchange. Whatever the method

used in conducting the class—lecture, recitation, laboratory or map work—there should be a definite checking up afterwards to determine the results of the exchange. Such exchanges can only be made as are allowed by the schedules of the various classes and divisions, and it may not be feasible for all divisions of each class to benefit. It is often possible, however, to make temporary readjustments to obviate this difficulty. Occasionally the schedules will allow a teacher to visit one of his or her own classes while it is being conducted by the exchange teacher. This is a distinct advantage to the teacher in follow-up work.

The joint meetings of classes were especially popular and have provided an excellent opportunity for the use of the "lecture method." That this method is adequate or advisable for constant use in high school teaching is doubtful, but the value of its occasional use cannot be denied. Furthermore, visual education and note-taking can easily be made valuable and indispensable adjuncts of the lecture method. Lantern slides were used constantly and thoro training was given in taking notes. The value of note-taking as an effective educational process is too often lost sight of, and many university students have not been adequately trained in note-taking. The joint meetings between biology and geography classes on forestry were especially successful. In the two lectures given before the entire student body, the material was of value in at least two courses. About one-third of the 550 pupils were engaged in taking regular notes for one of their courses.

This correlation work which proved so spontaneous and successful was developed thruout the remainder of the year. Several other exchanges and joint meetings were and might be suggested. Of all other subjects, history perhaps can best cooperate with geography. Chemistry classes and geography classes might get together for the study of certain industrial and commercial products. Geography could aid the languages with a short regional treatment and map study of the countries concerned. A little ingenuity will bring out many other subjects in which classes can cooperate. Geography, taught in this manner, is a subject that is admirably suited to be a correlating center for such work. Much of the drudgery will naturally and rightly fall upon the geography department. To the enthusiastic teacher, however, it will be instead of drudgery a fascinating experiment. It has been well said that geography is a "method" as well as a science.

A JAPANESE STORY

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NEED AND PURPOSE

After a number of lessons on the geography of Japan, the student teacher, in her effort to find a story which would review many of the geographic relationships already studied, could find none which seemed suitable to the purpose. Then the idea of writing an original story was suggested. As stories of children are always interesting to other children, it was decided as essential to use them as characters in the story. Significant and typical geographic environmental factors were then selected which could be used in such a story. The purpose of the narrative or geographic story was to show the use made of this environment. The geographic controls which permitted the activities described in the story had previously been studied, however, in some cases they were also reviewed in the story. In this lesson the following relationships were reviewed.

1. Straw houses used as a protection from earthquakes
2. Fishing from the river for food
3. Small farms due to density of population
4. Rice in flooded fields
5. Rain-proof clothing of straw
6. Large, shallow, straw hat a protection from the sun
7. Handmade sheaves due to small areas and density of population
8. Camphor making from native forests
9. Tea raising on hill sides
10. Baskets of straw and bamboo
11. Rolling of tea leaves requiring much hand labor
12. Tea dried in the sun
13. Mulberry orchard requiring much hand labor or care
14. Interplanting due to scarcity of land
15. Hand picking required in gathering mulberry leaves
16. Extensive growth of silkworms due to cheap, hand labor
17. The jinrikisha a popular means of transportation only where labor could be procurable
18. Lacquer industry of the city due to the production of lacquer wood and to sufficient labor
19. Trade between Japan and the United States

As the story was read to the children, they listed activities in which Taro was engaged. When the items listed were read, they were asked to give the geographic control which permitted such activity.

THE STORY

Taro was a little Japanese boy almost twelve years old. Taro had three big brothers and one baby sister, Take, who was not freely welcomed into this Japanese family simply because she was a girl. Every time anyone would ask Taro how many there were in his family he would say, "Mother, Father and three big brothers." He would never say he had a baby sister for girls in Japan are not counted. But this does not exactly say that Taro did not like his baby sister. He loved her and almost everywhere he went he carried little Take on his back.

Taro loved his home, simple as it was. Many days he was busy helping his father patch the little straw house and one could see him many times pulling the weeds from the flower beds of the family garden. In the spring of the year he especially liked to work in the garden for then, you know, it was cherry-blossom time and Taro liked so well to work among the pink and white trees.

Taro lived on a farm which was at the edge of one of the large Japanese cities. One part of the farm was bordered by a river. Here, Taro spent much of his time in the morning fishing. He supplied the family with fish which was a large part of their food. He liked the city but was always contented on his father's farm. The farm was small—very small compared to our American farms. It consisted of but five acres. You know land in Japan is not plentiful and there are so many people living there that the people must conserve the land.

One part of this small farm was devoted to the cultivation of rice. How Taro liked to help his father set out the tiny rice plants in the flooded fields! He delighted in paddling thru the muddy fields in his bare feet with a straw rain-proof coat and a large straw hat on his head. When harvest time came he always tied the rice sheaves for in Japan the fields are too small for the use of machines such as we have in our country.

On the edge of the rice field there was a very small forest of peculiar looking trees. But Taro did not think they were peculiar. Day after day he helped his big brother, Tashu, cut down the trees into small pieces so they would be ready to boil. These chips were camphor wood and in this way camphor was obtained.

Back of Taro's home was a large rolling hill covered with small green shrubs. These were tea bushes and when Taro was

not otherwise busily occupied, he often helped his other big brother and his mother pick the tea leaves. On his back he always carried a straw and bamboo basket. Into this he put the tea leaves which he picked. You would be surprised to see how many leaves he could pick in a few hours. In the evenings, then, he would sit on the floor and roll the little leaves and have them ready to place in the sun the next day.

Taro was seen on one part of the farm more often than anywhere else. That was in his mother's mulberry orchard. Long rows of mulberry trees were separated by rows of green vegetables. In this way, Taro's father made the best use of his small amount of land. Again, day after day, Taro could be seen with his straw basket and large straw hat picking leaves, but they were a different kind of leaves. They were mulberry leaves which he was picking for the silkworms which were cared for by his mother. On rainy days Taro delighted in feeding the little silkworms mulberry leaves. Many times the mother would allow him to clean the silkworm trays. And Taro always provided the little twigs for the silkworms when they were ready to spin their cocoons. One thing, however, which he could not do was to unwind the silk of the cocoons. He always tore the tiny threads; but he spent many hours watching his mother unwind them.

After working so well, Taro's father decided to take him to the city to visit his uncle. Taro was very much pleased. He had been to see his uncle only a few times but had never stayed any length of time. This time he could stay for several days. And he was going in a jinrikisha, too! His uncle was glad to see him and Taro found something to do at once. He was always busy, you will have noticed. In a short time he had learned to sandpaper lacquer boxes quite successfully. He liked this work but not nearly so well as his work on the farm. At the end of the week, Taro was ready to return home.

Taro had wonderful stories to tell about his visit to the city. He brought several gold fish for his baby sister. These he learned had been raised on fish farms in Japan. At once he suggested that his father start a fish farm and to please Taro, he did. Taro and another brother cared for the tiny fish and both of them liked their work. After a few years, Taro's gold fish scheme progressed and he sent his first shipment to the United States to be sold in art shops.

THE RIVER VERSUS THE SOIL IN THE LOWER MISSOURI VALLEY

(How a Change in Emphasis in these Geographic Factors has Produced Contrasted Activities in the Lower Missouri Valley)

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GEOGRAPHIC UNITY OF THE VALLEY

The Missouri River flows across the state of Missouri in a meandering course over its flood-plain thru a valley of topographic old age for a distance of approximately 600 miles. Bordering the valley are rows of from precipitous to moderately sloping limestone bluffs veneered with loess, prairie, or Ozark soil. The glacial prairies north of the valley wall and the Ozark highland to the south, because of topographic expressions which are different from those of the flood-plain, form boundaries of the valley. The flood-plain, because of its levelness, possesses topographic unity, the bounds of which are at the base of the valley walls.

The channel, except during flood, is confined to only part of the trough, the other part of which is bottom land, its average width of from three to seven miles being determined largely by the varying nature of the structure and composition of the geological formations thru which the river has cut.

The river winds thru a tract of deep, rich, alluvial soil, the Wabash Silt Loam. The river soil is bounded on both north and south by bluffs of Knox Silt Loam and Marshall Silt Loam,[1] prairie and loess soils of the uplands, as well as by several minor Ozark soils. Alluvial soil in the flood-plain and a difference in soils between lowlands and uplands give unity on the basis of soil. This soil unity is further emphasized by the fact that the different soil formations between uplands and lowlands evince themselves concurrently in two distinct and separate topographic units: one, the level flood-plain; the other, the walls of the valley.

The climate of the valley is the "Humid Continental Type with Long Summers."[2] Possessing a continental location in the belt of the prevailing westerlies with its accompanying cyclones and anti-cyclones, the valley experiences frequent changes of weather—

[1] Miller and Krusekopf, "The Soils of Missouri," in Bulletin 153, University of Missouri, College of Agriculture, 1918.

[2] Jones and Whittlesey, Types of Climate, p. 10.

variability in precipitation and marked diurnal and seasonal ranges in temperature. January is the coldest month with an average temperature of about 26° to 32°; and July is the warmest, with an average temperature of from 76° to 80°. The highest mean monthly temperature for a period of 32 years (1889-1921) was 83°, August, 1913; and the lowest, 15°, January, 1918; a range of 68°. The highest absolute temperature was 111°, July, 1901; the lowest, –26°, February, 1899; a range of 137°. The average annual precipitation is 38.34 inches, distributed as follows: spring, 11.91 inches; summer, 12.55 inches; autumn, 8.32 inches; and winter, 6.08 inches (records covering 16 years).[3] The maximum precipitation comes in summer as thunder showers, local, sporadic, usually of short duration, practically coincident with the periods of highest temperature. The highest monthly total precipitation for the 32 years was 9.69 inches, September, 1918; the lowest, .01 inches, November, 1917; a range of 9.68 inches.

The valley possesses climatic unity; but since the climatic factor is not distinctly differentiated from that of the adjacent uplands, the geographical boundaries of the flood-plain at the base of the valley walls have been determined by topography and soil.

Because of unity in the expression of each of the most important of the fundamental factors which constitute the geographical environment, namely: topography, climate, and soil, the flood-plain of the lower Missouri River (from Kansas City to the mouth) is a region which possesses geographic unity. The human responses, in direct accord with the expressions of the geographical environment, are unified by the dominance of general agriculture.

Human Responses

Transportation

The Missouri River possesses characteristics peculiar to a stream in old age. Sand drifts give rise to a shifting and migratory channel, forming sand bars and sloughs in places and destroying already existent ones in others. During the spring floods the river becomes a madly rushing stream, pouring into the placid Mississippi a volume of lashing, turbid waters mingled with trunks and branches of trees which it has wrested from the banks. Spring

[3] Climatological Service of Weather Bureau, Missouri Section, August, 1906, Columbia, p. 60.

floods and summer shoal waters and sand bars are serious handicaps to navigation.

For a century after its discovery, in 1763, the Missouri River was an artery of trade and communication from which trails and routes spread out to the south, west, and north. During this century the steamboat was the medium of the activity on the river. In 1819 the first steamboat ascended the Missouri for 200 miles. Ten years later, steamboats plied the river to Franklin in Howard County. In 1858 there were 59 regular packets on the lower river, besides 30 or 40 transient boats. This was the golden era of steamboating on the Missouri.

With the development of the steamboat came an increased growth of the fur trade, the earliest activity of the valley, dependent upon the watercourse as a means of contact with the west. At the height of the activity, in the third and fourth decades of the century, all the frontiers of the lower Missouri were divided into departments among the various sections of the Bernard Pratte and Company Branch of the American Fur Company of St. Louis. The procedure of the trade relied largely on water courses. Heterogeneous cargoes designed for Indians and trappers were brought by means of the Ohio and Mississippi from New Orleans, Quebec, and the East to St. Louis where they were loaded upon river steamers bound for posts along the Missouri. At the same time, the river was the highway to the southwest, a terminus of the Santa Fé trade which was rapidly assuming vast proportions. For over a decade Franklin was the emporium of the trade. But, with the advance of steamboat navigation, river towns further west (Independence, Westport Landing, Kansas City) became centers of the trade, cities that combined in their location the longest possible water route and a suitable breaking point to overland travel. A large navigable waterway proved an invaluable stimulus to the development of the fur and Santa Fé trades. But as the river was the primary factor in their development, it was probably the incipient cause of their decline. For, with the growth of the Middle West, fostered by the presence of a large river of westward trend, came the development of permanent settlements and the abandonment of responses to wilderness and frontiers.

The coming of the agriculturists into the valley marks the advent of the railroad in the 60's, with its efficient means of transportation; and river navigation, with its hazards and uncer-

tainties, declined, never to rise again to its former proportions. "The recollection of steamboating on the Missouri River is, to the old steamboat man, but a pleasant dream of the past."[4] The modern period has seen repeated attempts to revive water-borne traffic by improving the river; but the tremendous cost, the floods, snags, sandbars, and shifting channels, are obstacles of huge proportions. Prior to 1910, the amount expended in river improvement was $7,663,130.48. "The estimate of the cost for new work made in 1912 . . . was $20,000,000 for completion in ten years. The latest approved estimate of the annual cost of maintenance (of works already erected) is $500,000."[5] However, revetments and dikes built at various places along the river have saved much agricultural land from the ravages of the annual spring inundations. The failure to improve the river sufficiently for transportation has probably been caused by the absence of a comprehensive project of improvement of the river as a whole. Many small projects have been completed; but as only local works, they have affected commerce very little. "The fact that there is at this time (1901) little commerce on the river [this condition still prevails] is due entirely to the condition of the river, which is such that it is hazardous to run boats and impossible to obtain insurance at reasonable rates. No commerce of any consequence can be expected until the river is put in navigable condition and opened to the mouth."[6]

The earliest settlements of the valley were trading posts, and with an increase in permanent population came a growth of cities. The more important river towns were located on the north side of the flood-plain where tributaries, leading from a rich and extensive hinterland, join the main stream. Some cities were located at the base of a bluff. Still others were built high enough above the river to be protected from floods and "river fever" (malaria), yet situated so as to be accessible to river trade. Boonville in Cooper County was at an early date important as the northern terminus of a highway from the river thru the interior Ozarks to Springfield. Many towns, of which Franklin and Glasgow are examples, were built on the flood-plain, but were forced to the adjacent uplands because of floods and river erosion. Today most of the cities are located above the flood-plain but adjacent to it so

[4] P. E. Chappel, A History of the Missouri River, p. 98.

[5] Chief of Engineers, Report of War Department, 1921, I, p. 1250.

[6] Chief of Engineers, Report of War Department, 1901, Supplement, p. 374.

as to utilize either the river as a means of transportation or the railroads which traverse the flood-plain.

The railroads which cross the center of the state utilize the relatively level grade of the flood-plain wherever possible. The passenger line of the Missouri Pacific on its route from St. Louis to Kansas City follows the flood-plain except where a marked northward bend in the river interferes with the westward course of the railroad. The northern or freight line follows the flood-plain practically thruout its course. The Missouri, Kansas and Texas parallels the north shore half-way across the state from St. Louis, after which it cuts southwest across the uplands. For approximately the last ninety miles the Wabash follows the flood-plain to Kansas City.

Agriculture

The most valuable economic response to the geographical environment of the flood-plain is general agriculture. The valley was early settled by pioneer-farmers from the south and southeast who engaged in hunting and in raising sustenance crops on small farms. Later, hemp and tobacco planters were attracted to the deep, rich soil. However, these plantations declined after the disappearance of slavery. After 1860 there was a transition to the modern economic feature of mixed farming, the distinctive element of which is the raising of staple crops. The rich alluvial soil, the variable climate, not too severe, and a moderate and well distributed rainfall during a long growing season (of approximately 180 days)[7] are favorable to husbandry and make possible a wide range of products.

There is a rather marked relationship between the character of agriculture and the character of the soil. The soils vary from light sandy loam to heavy black clay. In many of the lower areas, "gumbo," a rather pure clay, occurs. Because of its heavy and clayey nature, it holds an excess of the flood waters brought to it annually, thereby becoming in its natural condition unsuitable for agriculture, and thus gives rise to one of the vital problems of the bottom lands—the need for drainage. In general, the overflow sections of clay or "gumbo" possess a poor type of farm and tenant-farmer. These people are largely of foreign descent—

[7] U. S. Dept. Agriculture, Weather Bureau; Summary of the Climatological Data for the U. S., Section 50, 1920.

Germans, Bohemians, Austrians, and Scotch Irish. They are thrifty and work industriously, but their life is hard, they can not accumulate money, and they get along on the bare necessities of life. Even the women and children work hard many hours a day. Absentee landlords own the property which sells for only $40 to $100 an acre, and the tenants pay crop rent for their small farms. As a result, the type of farming does not resemble that of the prosperous upland farmers with their efficient farming methods and good crops.[8] Higher and further removed from the river, the lighter sandy loam gives large yields of corn, wheat, and alfalfa, and is becoming productive in trucking and livestock. There is little tenantry. The farmers own most of the land which ranges in value from $100 to $200 per acre.

The factor which accounts largely for the difference in the development of farming in the flood-plain is drainage. The location of the land with regard to immunity from overflow affects its value. Overflow land sells for $20 to $25 per acre; the drained lower bottoms average from $50 to $70; and the high bottom lands are valued from $80 to $125. In order to drain adequately the periodically inundated land, drainage districts have been established at various places along the Missouri.[9]

In the valley "Corn is King," a response to the ideal climatic, topographic, and soil conditions. The yellow corn is utilized for stock feed, ensilage being a widespread practice. Winter wheat is the crop of second importance. Because of the fact that the growing season of wheat corresponds to the period of greatest moisture on the flood-plain when it is not possible for machine cultivation (during the flood seasons), wheat is well adapted to this area. Wheat, harvested in June and July after the floods, is followed by corn. In addition, secondary crops of oats, rye, alfalfa, clover, and hay are raised which form the basis of a remunerative dairy and livestock industry. Abundant water and a moderate climate, permitting a long out-door grazing season, are other stimuli for its growth. Dairying is most highly developed near the large centers of consumption. Likewise, near the cities where transportation facilities are good, small farms are devoted to intensive trucking.

[8] This information was obtained from a letter to the writer from J. W. Burch, County Extension Agent, Callaway County, November, 1922.

[9] U. S. Dept. of Commerce, Bureau of Census, Drainage: Missouri, 1920.

Excellent climate, fertile alluvial soil, good transportation facilities, and drainage improvements have given rise to general agriculture—the unifying activity of the valley and the feature economic response to the geographical environment.

The flood-plain of the lower Missouri valley has geographic entity, unified by topography, soil, and climate, and dominated by the river. Directly responding to the factors of the geographical environment is a unity of human adjustments, the fundamental nature of which depends foremost upon the very existence of the river. The river is always there—a fact, a thing to be reckoned with in some way or other.

THE CLIMATES OF PHYSIOGRAPHIC REGIONS

CHARLES F. BROOKS
Clark University

While the general features of climate are the same over large regions, and show no more respect for a physiographic boundary than does a wind or traveling rainstorm, each physiographic region makes its local imprint on the general climate. The degree to which this local imprint can be made depends on (1) the roughness of the topography, (2) the time during which the topography can work its effect on such air masses as come within its influence and (3) the impressionableness of the general climate.

We may classify the roughness of the topography according to terms used by Dr. W. W. Atwood in his "New Geography": Lowlands, Uplands, Old worn down mountains, Plateaus, and Young rugged mountains. The relatively small contrasts from place to place on lowlands is not conducive to a strong tendency to the development of local climates differing appreciably from the general. The greater elevation of uplands, and their diversity of slope and land surface tend toward the development of mountain vs. valley climates. In old, worn-down mountains this is still more the case, mountain and valley climatic characteristics being easily recognizable most of the time. The height and the dryness of air over plateaus favors a strong development of continental climatic characteristics, the plateau climate of climatologists. Where there are steep valleys pronounced mountain and valley climates occur. Finally, the general height and great contrasts of elevation and ex-

posure found in young rugged mountains give them local climates which strongly dominate, and mask the less obvious features of the general climate.

The time during which the topography can work its effect on such air masses as come within its influence is controlled by the strength of the general wind and by the ability of the topography to retain masses of the passing air. Over the strength of the general wind the topography has no direct control except as an obstruction, so the effect of topography on this factor is simply the result of its retentiveness for air. The lowland tends to retain passing air only when it can cool the surface air enough to allow the general wind to slide easily over such a denser layer. In the minor irregularities of a lowland, as, for example, forests and valleys, there is further retentiveness. On an upland this is still more marked. In old, worn-down mountains the air is made to tarry still longer, while in the clefts of plateaus and in the deep valleys of a young, rugged mountain region the same air may be retained for days and subjected to the local effects of the topography. While only a moderate wind is sufficient to keep practically all the air on a lowland moving freely, a strong wind, or even a gale, if it be warm, may not rout out colder air in the valleys of a rugged region.

The impressionableness of the general climate depends on the frequency with which weather types favoring local climates occur. In general, the quiet weather, resulting in long stays of the air, and the clear weather, allowing the maximum of diversity of local heating, especially in summer, and cooling, particularly in winter, bring out the strongest developments of local climates. But moist air, favoring the formation of lowland and valley fogs in quiet weather, and the occurrence of mountain clouds, precipitation, and foehn winds in windy weather, also is a factor productive of local differences in climate. In extremely windy weather the influences of local topography are likely to be greater than in moderately windy conditions, for the effects of surface irregularities are carried much higher in a gale than in a brisk wind. Thus a minor obstruction may start a major cloud and result in some precipitation locally induced even in a region only as moderately hilly as an upland. In a young, rugged mountain region, a gale will make much heavier rainfall on the windward slopes than will a lighter wind and it will more greatly increase the temperature of the leeward

slopes as it warms by compression on descent. In moderate winds with generally falling temperature and cloudy skies the effects of local topography are perhaps least.

CONCLUSION

The degree of development of local climates varies directly (1) as the roughness of the topography, (2) the time during which a mass of air can remain, and (3) the frequency with which general conditions permit the occurrence of quiet, clear weather or damp, very windy weather. Local differences of temperature and wind develop best in the quiet weather, and contrasts in rainfall, as well, in mountain regions when the humidity is high, while local differences of rainfall, and sometimes also of temperature, become most pronounced for all forms of topography when a damp gale is blowing. It seems reasonable, therefore, to divide climatic provinces, already deliminated according to the combined effects of latitude, general altitude, and exposure to continental and marine winds, on the basis of topography, preferably in terms readily applicable the world over: e. g., lowlands, uplands, old worn-down mountains, plateaus, and young rugged mountains.

GEOGRAPHY CONTEST

Can you read the geography story told by a photograph? Can you determine the probable climate of the region pictured? Can you determine the life adjustments or responses to the environment? Can you determine the probable location of the place pictured? Can you determine the probable or possible occupations of the people in the region pictured?

THE PLAN

1. At intervals during the present school year an unlabeled photograph will be published on the front cover of the *Journal.*

2. You are to write a descriptive title—that is, a geographic interpretation—for this photograph. The title should (1) state the probable location of the scene pictured, (2) describe what the picture shows—especially life adjustments to the environment, and (3) state what in the picture enabled you to reach your conclusion and write your description.

3. Your descriptive title must be in the Editor's Office by the twenty-fifth of the month following the month of publication.
(Example: The title for a photograph published in November must be in by December 25.) *Get your students busy at once!*

WHO MAY COMPETE

The contest is open to students in any elementary school or high school.

THE AWARD

The *Journal of Geography* will be sent for one year to each of the ten schools sending in the best geographic interpretation. *You have ten chances to win!* In case two or more equally good titles are received the award will be made to the school whose report is received first. The whole school may work as a unit in preparing the title. The names of the winning schools will be published in the *Journal* but no advance announcement will be made. All titles will be read and judged by Miss Cora P. Sletten.

SPECIAL REQUIREMENTS

1. Have title typewritten or copied in legible long hand.
2. Give name of school and address, and name of teacher. If the title was prepared by a single student give name of student. If prepared by a particular grade give the grade as, fourth, seventh, ninth, etc. Send any other helpful information concerning the school or course in geography.
3. Send all titles to the following address.

THE JOURNAL OF GEOGRAPHY,
State Teachers College,
MANKATO, MINNESOTA

THE NATIONAL COUNCIL MEETING

Washington—1924

Plans are now nearing completion for the next annual meeting of the National Council to be held in Washington, D. C., December 29, 1924. The sessions will be held thruout the day and evening. The evening session will be held in connection with the annual banquet. The meetings of the American Association for the Advancement of Science and of the Association of American Geographers will follow those of the National Council. The morning and afternoon sessions will be held in the library of the National Geographic Society at 16th and M streets, N. W.; the dinner and evening meeting at the Blue Triangle Center, Y. W. C. A., 20th and B streets, N. W. Dinner, $2.00. Special railroad rates of a fare and one-half, on the certificate plan, have been granted from all parts of the United States and from much of Canada. Do not fail to obtain a *Standard Certificate* when you purchase your ticket. This will entitle you to a half-fare ticket home by the same route. This is the opportunity and now is the time to plan that trip to the Capital City! Write the Secretary—Geo. J. Miller, State Teachers College, Mankato, Minnesota—saying that you will be at the banquet and to reserve a place for you. DO IT NOW and let nothing keep you away.

Headquarters at Powhatan Hotel, 18th and H streets, N. W.

PRELIMINARY PROGRAM

Monday, December 29, 9:30 A. M.

A General Social Science Course Versus Separate Courses in Geography. Harold Rugg, Teachers College, New York

Geography as a Social Science. George J. Miller, State Teachers College, Mankato, Minnesota

The Ozark Region of Illinois—A Regional Study. Ina C. Robertson, State Teachers College, Valley City, North Dakota

Monday, December 29, 2:00 P. M.

Objectives of Geographic Instruction—Presidential Address. W. R. McConnell, Miami University, Oxford, Ohio

Geographic Principles in the Study of Cities. D. C. Ridgeley, Clark University, Worcester, Massachusetts

Report of the Committee on "Criteria for Judging Textbooks in Geography." W. M. Gregory, Cleveland School of Education

Report of the Committee on "Course of Study in Geography for the Intermediate Grades." Erna Grassmuck, State Department of Education, Harrisburg, Pennsylvania

Monday, December 29, 6:00 P. M.

Some Geographic Opportunities and Responsibilities. Charles C. Colby, University of Chicago

Discussion

Annual Meeting of the Board of Directors

GEOGRAPHICAL PUBLICATIONS

R. H. Whitbeck and V. C. Finch. **Economic Geography.** 558 pp., 330 maps, diagrams, and photos. McGraw-Hill Book Co., N. Y. 1924.

That college textbooks in the various fields of geography are rapidly increasing in number is a recognition that the subject has won a permanent and important place in the general scheme of higher education. Whitbeck and Finch have struck out boldly in one of the more newly recognized fields of geography and have set a high standard indeed for later authors to strive to reach or excel.

In their introduction the authors have clearly stated their position that economic geography embraces three major subdivisions, viz., agricultural, industrial and commercial geography. Also that "as a branch of science economic geography endeavors to show the influences exerted by topography, climate, position, and by soil and other natural resources upon the various types of activity by means of which man gains his living." These clear cut statements are needed. Geographers themselves have not always had clearly in mind the specific fields of the several branches of their subject. Definitions thus given, altho perhaps not completely accepted by all, will lead to wholesome discussion and ultimate agreement. In an earlier paragraph however, the authors appear to definitely challenge criticism when they declare that the more important subdivisions of the field of scientific geography are, "(1) economic geography, (2) political geography, (3) historical geography, and (4)military geography." One wonders why these subdivisions were honored by name and the older and more generally recognized subdivisions, e. g. physical and regional geography, ignored.

The first chapter gives a clear recognition to the effectiveness of non-geographic influences in human development. This is a commendable stroke in disarming any potential critics should they attempt to assert that geography claims any monopolistic position.

The book contains thirty-six chapters grouped into two main parts. Part I deals with the United States and Canada while Part II deals with the World Outside of the United States and Canada. In Part I the industrial or commodity basis is dominant and the various sections of Anglo-Saxon America are approached thru their characteristic industries. The first chapter in this part, (Chapter II of the book) gives a general summary of "Agriculture in the United States and Canada." There in bold strokes are presented the dominant influences, topographic, climatic, soil, and transportation, which have led to the development of particular types of agricultural areas. Following the general picture thus drawn, Chapters III—XI inclusive, are devoted to special fields of industrial activity, from grains, fibers, vegetables, animals and fisheries to forest and forest products. Chapters XII—XVII inclusive, are devoted to the mineral industries, manufacturing, trade and transportation, followed by Chapter XVIII, Canada (a summary). The reviewer feels that the summary thus presented for Canada is highly commendable. It is to be hoped that a similar summary of the United States can be worked out and presented in later editions.

Part II deals with foreign countries. The number of pages almost exactly equals that given to Part I. But in this part the political or country basis is the mode of approach adopted. The sequence of discussion leads first to Mexico and the Caribbean Lands, thence to South America, Europe, Asia, Africa and Australia and New Zealand. In each unit of study the essentials of physical environment are presented but emphasis is given the occupations of the people, their positions as surplus producers of some commodities, and as markets for other lines. In this manner a world view of industry and trade is developed. Thus also the student is led to an appreciation of the im-

portance of economic factors in the development of political relations on an international scale.

Altho intended as a college textbook it is written in such style as to be within reach of intelligent readers in high school or out of school. It is especially suitable as a reference work for high school courses in commercial or industrial geography.

A highly commendable feature of the book consists of the references given at the close of each chapter. These lists are only of moderate length but they have been carefully selected so as to meet the usual requirements of the college student or specially interested general reader, when he desires fuller discussion or more exhaustive detail on some parts of the subject.

On the whole the book is well written, *causal relations* is the keynote thruout, and it is a dignified and worthy contribution to the geographic literature of the age. The publishers have also done their part in a manner worthy of commendation. The book is substantially and handsomely bound, splendidly illustrated, and on excellent quality paper. It merits and will undoubtedly receive a cordial reception by the educational world.

University of Nebraska NELS A. BENGTSON

Philip A. Knowlton. **First Lessons in Geography.** 257 pp., 200 photographs and illustrations. The Macmillan Co., N. Y. 1924. $0.96.

This textbook is intended for the use of "all children who have mastered the mechanics of primary reading." How we get our various foods, our clothing, our shelter, our fuel, how we transport people and goods, how we trade goods and exchange messages are the principal topics of the twenty-seven chapters. The numerous illustrations are clear cut, and the print, excellent.

This book has little to offer to those who believe that geography is a study of human adjustments to the various factors in the natural environment. It is a conglomeration of material taken from the natural and social sciences. What geography is to be found in relating the operation of a steam engine, a dynamo, a motor? Is a geography text the book to which we would turn to learn the cuts of beef, the difference between calico and gingham?

The author's simplicity in sentence construction is commendable, but there are times when his choice of words violates the most elementary principles of science. "When enough water has been sucked up so that the air is damp, thousands of little raindrops come together and form a cloud." "All round things roll down hill. So do raindrops" . . . which . . . "roll down into the cracks in the soil." Often his statements are positively misleading. Thus, one wonders what sense of direction, location and climate a child will have when he has been taught that "peaches are grown about equally well in the north and south," that "lands in the far south" always have summer, that St. Paul and St. Louis are "far-away cities of our country."

State Teachers College, CORA P. SLETTEN
Mankato, Minn.